



PRELIMINARY

LH0003/LH0003C

Wide Bandwidth Operational Amplifier

General Description

The LH0003/LH0003C is a general purpose operational amplifier which features: slewing rate up to 70 V/ μ s, a gain bandwidth of up to 30 MHz, and high output currents.

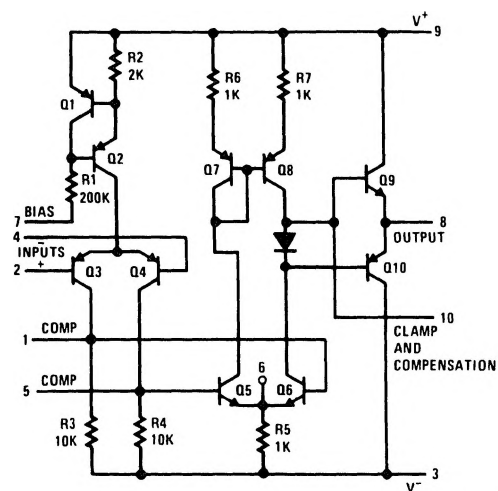
The LH0003 is specified for operation over the -55°C to $+125^{\circ}\text{C}$ military temperature range. The LH0003C is specified for operation over the 0°C to $+85^{\circ}\text{C}$ temperature range.

Features

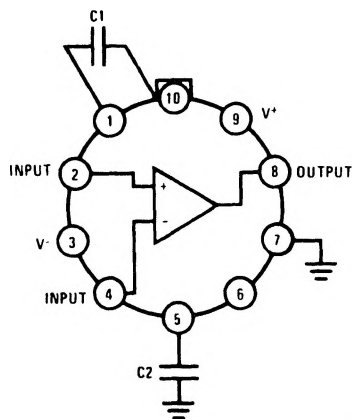
- Very low offset voltage
- Large output swing
- High CMRR
- Good large signal frequency response

Typically 0.4 mV
 $> \pm 10\text{V}$ into 100Ω load
 Typically $> 90\text{ dB}$
 50 kHz to 400 kHz depending on compensation

Schematic and Connection Diagrams



TL/H/5561-1



Top View

TL/H/5561-2

Order Number LH0003H or LH0003CH
 See NS Package Number H10G

Typical Compensation

Circuit Gain	C ₁ pF	C ₂ pF	Slew Rate R _L > 200 Ω , V/ μ sec	Full Output Frequency R _L > 200 Ω V _{OUT} = $\pm 10\text{V}$
≥ 40	0	0	70	400
≥ 10	5	30	30	350
≥ 5	15	30	15	250
≥ 2	50	50	5	100
≥ 1	90	90	2	50

Absolute Maximum Ratings

If Military/Aerospace specified devices are required, contact the National Semiconductor Sales Office/Distributors for availability and specifications.

(Note 3)

Supply Voltage	$\pm 20V$
Power Dissipation	See Curve
Differential Input Voltage	$\pm 7V$
Input Voltage	Equal to Supply

Load Current	120 mA
Operating Temperature Range	
LH0003	-55°C to $+125^{\circ}\text{C}$
LH0003C	0°C to $+85^{\circ}\text{C}$
Storage Temperature Range	-65°C to $+150^{\circ}\text{C}$
Lead Temperature (Soldering, 10 sec.)	260°C
ESD rating to be determined.	

Electrical Characteristics (Notes 1 & 2)

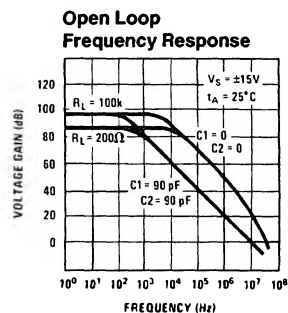
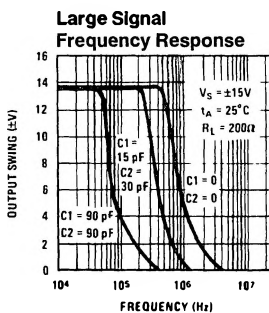
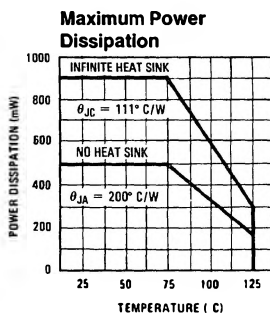
Parameter	Conditions	Min	Typ	Max	Units
Input Offset Voltage	$R_S < 100\Omega$		0.4	3.0	mV
Input Offset Current			0.02	0.2	μA
Input Bias Current			0.4	2.0	μA
Supply Current	$V_S = \pm 20V$		1.2	3	mA
Voltage Gain	$R_L = 100k, V_S = \pm 15V, V_{OUT} = \pm 10V$	20	70		V/mV
	$R_L = 2k, V_S = \pm 15V, V_{OUT} = \pm 10V$	15	40		V/mV
Output Voltage Swing	$V_S = \pm 15V, R_L = 100\Omega$	± 10	± 12		V
Input Resistance			100		k Ω
Average Temperature Coefficient of Offset Voltage	$R_S \leq 100\Omega$		4		$\mu\text{V}/^{\circ}\text{C}$
Average Temperature Coefficient of Bias Current			8		nA/ $^{\circ}\text{C}$
CMRR	$R_S < 100\Omega, V_S = \pm 15V, V_{IN} = \pm 10V$	70	90		dB
PSRR	$R_S < 100\Omega, V_S = \pm 15V, \Delta V = 5V$ to $20V$	70	90		dB
Equivalent Input Noise Voltage	$R_S = 100\Omega, f = 10\text{ kHz}$ to 100 kHz $V_S = \pm 15V$ dc		1.8		μVrms

Note 1: These specifications apply for Pin 7 grounded, for $\pm 5V < V_S < \pm 20V$, with capacitor $C_1 = 90\text{ pF}$ from Pin 1 to Pin 10 and $C_2 = 90\text{ pF}$ from Pin 5 to ground, over the specified operating temperature range, unless otherwise specified.

Note 2: Typical values are for $T_A = 25^{\circ}\text{C}$ unless otherwise specified.

Note 3: Refer to RETS0003X for LH0003H military specifications.

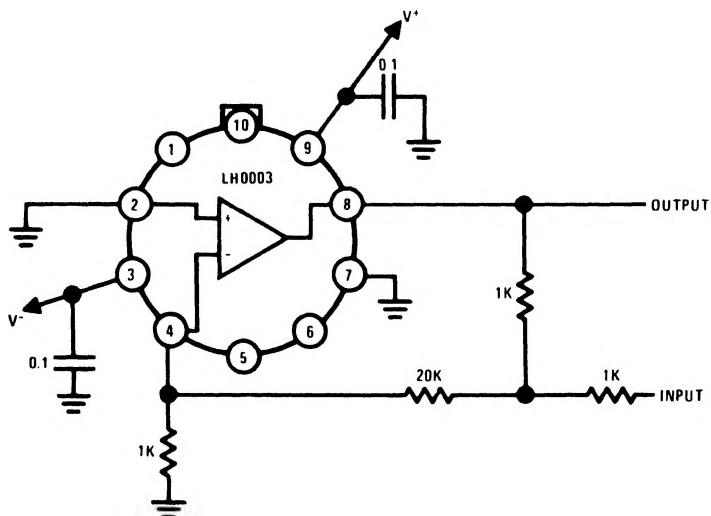
Typical Performance Characteristics



TL/H/5561-5

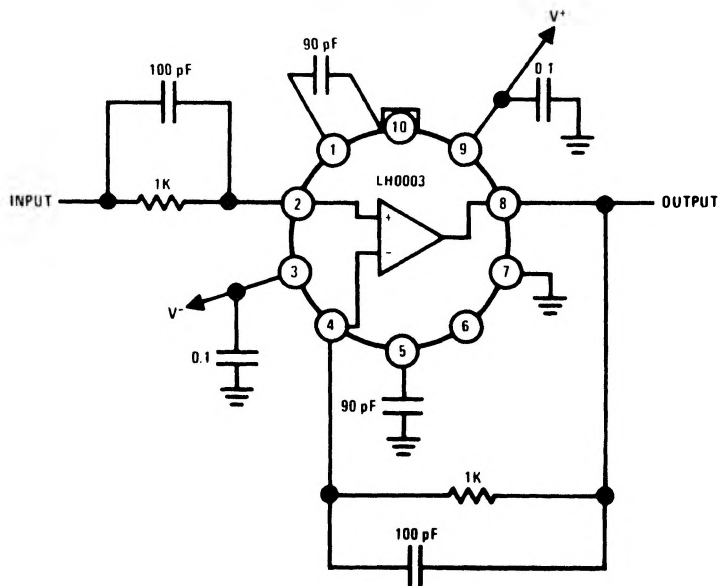
Typical Applications

High Slew Rate Unity Gain Inverting Amplifier



TL/H/5561-3

Unity Gain Follower



TL/H/5561-4